General

Guideline Title

ACR Appropriateness Criteria® acute trauma to the ankle.

Bibliographic Source(s)

Mosher TJ, Kransdorf MJ, Adler R, Appel M, Beaman FD, Bernard SA, Bruno MA, Dempsey ME, Fries IB, Khoury V, Khurana B, Roberts CC, Tuite MJ, Ward RJ, Zoga AC, Weissman BN, Expert Panel on Musculoskeletal Imaging. ACR Appropriateness CriteriaÂ® acute trauma to the ankle [online publication]. Reston (VA): American College of Radiology (ACR); 2014. 10 p. [66 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Bennett DL, Daffner RH, Weissman BN, Bancroft L, Blebea JS, Fries IB, Jacobson JA, Morrison WB, Payne WK III, Resnik CS, Roberts CC, Schweitzer ME, Seeger LL, Taljanovic MS, Wise JN, Expert Panel on Musculoskeletal Imaging. ACR Appropriateness Criteria® suspected ankle fractures. [online publication]. Reston (VA): American College of Radiology (ACR); 2008. 4 p. [26 references]

Recommendations

Major Recommendations

ACR Appropriateness Criteria®

Clinical Condition: Acute Trauma to the Ankle

Variant 1: Adult or child >5 years old. Patient meets Ottawa Ankle Rules:

1. Inability to bear weight immediately after the injury, OR
2. Point tenderness over the medial malleolus, or the posterior edge or inferior tip of the lateral malleolus or talus or calcaneus, OR
3. Inability to ambulate for four steps in the emergency department.

Radiologic Procedure	Rating	Comments	RRL*
X-ray ankle	9	Obtain AP, lateral, and mortise views.	☢
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			***Relative Radiation Level**

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Variant 2: Adult or child >5 years old. Acute injury to the ankle; does not meet the Ottawa Ankle Rules. No point tenderness over the malleoli, talus, or calcaneus on physical examination. Able to walk. Neurologically intact (including no peripheral neuropathy). First study.

Radiologic Procedure	Rating	Comments	RRL*
X-ray ankle	1	Obtain AP, lateral, and mortise views.	☢
CT ankle without contrast	1		☢
CT ankle with contrast	1		☢
CT ankle without and with contrast	1		☢
MRI ankle without contrast	1		O
MRI ankle without and with contrast	1		O
US ankle	1		O
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			***Relative Radiation Level**

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Variant 3: Adult or child >5 years old. Acute injury to the ankle. Does not meet Ottawa Ankle Rules. Patient is not neurologically intact and/or has a peripheral neuropathy that involves the ankle and foot. First study.

Radiologic Procedure	Rating	Comments	RRL*
X-ray ankle	9		☢
CT ankle without contrast	1		☢
CT ankle with contrast	1		☢
CT ankle without and with contrast	1		☢
MRI ankle without contrast	1		O
MRI ankle without and with contrast	1		O
US ankle	1		O
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			***Relative Radiation Level**

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Variant 4: Adult or child >5 years old. Acute injury to the ankle with persistent pain. Radiographs not obtained at time of injury. Initial study.

Radiologic Procedure	Rating	Comments	RRL*
X-ray ankle	9	Obtain AP, lateral, and mortise views.	☢
CT ankle without contrast	1		☢
CT ankle with contrast	1		☢
CT ankle without and with contrast	1		☢
MRI ankle without contrast	1		O
MRI ankle without and with contrast	1		O
US ankle	1		O
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			***Relative**

Radiologic Procedure	Rating	Comments	Radiation RRL* Level

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Variant 5: Adult or child >5 years old. Acute injury to the ankle with >1 week persistent pain. Initial radiographs negative.

Radiologic Procedure	Rating	Comments	RRL*
MRI ankle without contrast	6		O
X-ray ankle	5	Obtain AP, lateral, and mortise views.	☢
CT ankle without contrast	5		☢
US ankle	5		O
CT ankle with contrast	1		☢
CT ankle without and with contrast	1		☢
MRI ankle without and with contrast	1		O
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			***Relative Radiation Level**

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Variant 6: Adult or child >5 years old. Acute injury to the ankle. Radiographs demonstrate talus fracture. Next study.

Radiologic Procedure	Rating	Comments	RRL*
CT ankle without contrast	9		☢
X-ray ankle Broden's view	5		☢
MRI ankle without contrast	5		O
CT ankle with contrast	1		☢
CT ankle without and with contrast	1		☢
MRI ankle without and with contrast	1		O
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			***Relative Radiation Level**

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Variant 7: Adult or child >5 years old. Acute injury to the ankle. Radiographs suggest an osteochondral injury. Next study.

Radiologic Procedure	Rating	Comments	RRL*
MRI ankle without contrast	8		O
CT ankle without contrast	5		☢
CT ankle with contrast	1		☢
CT ankle without and with contrast	1		☢
MRI ankle without and with contrast	1		O
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			***Relative Radiation Level**

Note: Abbreviations used in the table are listed at the end of the "Major Recommendations" field.

Variant 8: Adult or child >5 years old. Acute injury to the ankle. Radiographs and/or physical examination suggest syndesmotic injury. Next study.

Radiologic Procedure	Rating	Comments	RRL*
X-ray tibia/fibula	9	Obtain AP and lateral views.	☢
MRI ankle without contrast	8		O
CT ankle without contrast	5		☢
CT ankle with contrast	1		☢
CT ankle without and with contrast	1		☢
MRI ankle without and with contrast	1		O
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			***Relative Radiation Level**

Summary of Literature Review

Introduction/Background

The musculoskeletal expert panel has reviewed pertinent articles dealing with patients with ankle injuries. The reviewed papers were primarily concerned with missed fractures and improving fracture detection or with the establishment of clinical criteria that would decrease the number of ankle radiographs without missing significant injuries.

Ankle injuries are frequently diagnosed and treated in United States emergency departments (ED) with an incidence of approximately 200 visits per 100,000 person-years. Of patients with acute ankle injuries undergoing radiographic evaluation the incidence of ankle fracture varies widely with season, athletic activity, and practice setting, ranging from 2.4% in outpatient sports medicine centers to greater than 20% in the ED setting. Recent evidence-based clinical treatment guidelines and systematic review of economic analyses support the role of radiography in evaluation of select patients suspected of having an ankle fracture with a limited role of cross-sectional imaging primarily as a tool for preoperative planning and as a problem-solving technique in patients with persistent symptoms and suspected of occult fracture.

Variant 1: Patients Meeting Ottawa Rules – Inclusion Criteria.

Given the relatively low incidence of fracture in patients experiencing ankle trauma, the Ottawa Ankle Rule (OAR) criteria were established to identify those patients with sufficiently low probability of fracture that they can safely be treated without radiographic evaluation. Subsequently, the validation and cost-effectiveness of these guidelines have been confirmed in numerous studies and have been extended to a variety of outpatient practice settings. These guidelines recommend ankle radiographs in patients with the following clinical findings: 1) inability to bear weight immediately after the injury and take 4 steps in the ED or 2) bone tenderness at the posterior edge and tip of either malleolus. Application of the OAR for evaluation of acute trauma to the foot is reported in a separate American College of Radiology (ACR) Appropriateness Criteria®.

In a 2003 systematic review of 27 studies including 15,581 patients, the sensitivity of the OAR in excluding fracture was 97.6 (95% confidence interval [CI], 96.4–98.9), median specificity was 31.5 (95% CI, 23.8–44.4), and the pooled OAR had a negative likelihood ratio of 0.10 (95% CI, 0.06–0.16). Using these guidelines, <2% of those who are negative for fracture using the OAR actually have a fracture. Although originally derived for adult patients, a systematic review of studies including patients ≤18 years of age found the OAR had a pooled sensitivity of 99% (95% CI, 97%–99%) and specificity range of 8%–50%. In an attempt to improve specificity, the OAR guidelines have been modified by changing the area of palpation from the posterior edge to the midportion of the malleoli (Buffalo modification) using a tuning force to test for pain in the malleolus (tuning fork test) or by applying indirect force on the bone (Bernese Ankle Rules). These modifications have not been widely adopted or tested in independent trials.

In the clinical setting, radiographs of the foot and ankle are often obtained together, even though the pain can almost always be localized to one area or another. In a retrospective review of 243 patients presenting with isolated acute ankle symptoms who simultaneously had ankle and foot radiographs, 55 had fractures including 9 fractures at the base of the fifth metatarsal, which were visualized on the ankle series. No additional fractures were identified on the dedicated foot radiographs. In the presence of an inversion injury of the ankle, foot radiographs have no role in management. It is widely accepted that an adequate radiograph of the ankle should include the base of the fifth metatarsal bone distal to the tuberosity.

An evaluation of the traumatized ankle should consist of anteroposterior (AP), lateral, and mortise views of the ankle. Additional views can be added to the minimal series in questionable cases. In the setting of suspected deltoid ligament disruption following supination-external rotation injuries of the ankle, a gravity-stress view has been shown to be as reliable and is perceived to be more comfortable than that obtained with manual stress. The fifth metatarsal base distal to the tuberosity should be seen on at least one projection. The use of a pertinent clinical history for the site of point tenderness will decrease the miss rate for subtle fractures by approximately 50%.

Variants 2 and 3: Acute Ankle Trauma in Patients Not Meeting Ottawa Rules Inclusion Criteria.

The OAR are validated in children >5 years of age and should not be used in patients with decreased sensation or inability to communicate.

Variants 4 and 5: Acute Injury to the Ankle with Persistent Pain. Initial Radiograph Negative or Not Obtained at Time of Injury

Persistent pain following trauma may be associated with a radiographically occult fracture or soft-tissue injury. A group of researchers have shown that occult fractures of the ankle may present with a large ankle effusion (>15 mm) in the absence of a visible fracture. However, this is an uncommon imaging scenario in that it occurred in <1% of all the radiographs taken in the study. The vast majority of ankle radiographs with a large joint effusion following trauma had a visible fracture on the radiograph. In those rare cases in which a large joint effusion is seen on the radiograph but no fracture is visible, a computed tomography (CT) scan will demonstrate a fracture in a third of these cases. The spiral fracture of the distal tibia is frequently associated with a nondisplaced fracture of the posterior malleolus of the tibia that may not be demonstrated on radiographs.

One study used multidetector CT (MDCT) of the ankle in multitrauma patients and compared MDCT findings with radiographs. When compared to MDCT, radiographs were 87% sensitive in detecting calcaneal fractures, 78% sensitive in detecting talar fractures, and 25% to 33% sensitive in detecting midfoot fractures. Only 5 of 21 Lisfranc fracture dislocations were detected on radiographs. Another study compared low-field (0.2T) magnetic resonance imaging (MRI) and conventional radiography and found no statistical difference in the detection of acute fractures of the distal extremities. A group of authors compared clinical outcomes (need for eventual treatment of an injury) between radiography and MRI in the setting of acute ankle trauma and found that a positive radiograph was a better positive predictor of the need for treatment than a positive MRI. However, neither a negative radiograph nor a negative MRI was good at predicting lack of need for future treatment of an injury. A systematic review of MRI bone marrow edema lesions associated with acute ankle injury found the clinical prognosis of patients with these lesions is good and requires no specific treatment.

In skeletally immature patients with an open distal fibular physis and focal tenderness of the lateral malleolus the incidence of occult Salter Harris I fracture on initial radiographs was reported to be 18% with no displacement of the fracture on follow-up radiographs. An analysis of 30 pediatric patients undergoing MRI for evaluation of acute ankle fracture found MRI provided no additional therapeutic value.

Variant 6: Acute Injury to the Ankle. Radiographs Demonstrate Talus Fracture. Next Study.

Although an uncommon injury, a series of studies report fractures of the talus that are not demonstrated on standard radiographic views. Lateral process fractures of the talus are increasing in frequency with the growing popularity of snowboarding. These patients typically present with a history of rapid inversion and dorsiflexion with point tenderness anterior and inferior to the lateral malleolus. These fractures may be minimally displaced and misdiagnosed as lateral ankle sprains. Evaluation of fragment displacement can be improved with the use of Broden view or, more frequently, with MDCT.

MDCT is recommended for preoperative planning for patients with high-energy polytrauma and in those with complex foot and ankle fractures. Although there are limited data regarding diagnostic accuracy, clinical treatment reviews recommend CT to determine degree of displacement in the preoperative planning evaluation for fractures of the talus.

Variant 7: Acute Injury to the Ankle. Radiographs and/or Physical Examination Suggest an Osteochondral Injury. Next Study.

Approximately 50% of ankle sprain injuries and 70% of ankle fractures are likely to result in some form of cartilage injury. Although radiographs can demonstrate displaced osseous lesions and associated fractures, they do not demonstrate cartilage or bone contusions related to osteochondral lesions. In cases with persistent pain and symptoms of locking, clicking, stiffness, and ankle swelling, MRI is the study of choice to identify, quantify, and differentiate chondral lesions. In a study evaluating patients without radiological abnormalities with MRI within 48 hours of the traumatic episode an osteochondral lesion was identified in 3 of 38 (8%) cases. In a recent comparison 3T MRI has been shown to have greater diagnostic accuracy than 1.5T for evaluation of the articular surface and integrity of the subchondral bone plate.

Variant 8: Acute Injury to the Ankle. Radiographs and/or Physical Examination Suggest Syndesmotic Injury. Next Study.

Due to clinical limitations in diagnosing injuries of the syndesmosis, MRI has been recommended as an adjunct in select cases. In a prospective study of 51 subjects, a group of researchers found the Lauge-Hansen classification of fracture predicted syndesmotic injury identified with MRI with a sensitivity of 0.92 (95% CI, 0.79–0.98) and a specificity of 0.92 (95% CI, 0.64–0.998). Patients with a proximal fibular fracture and

syndesmotic injury (Maisonneuve fracture) may not have localized rest pain at the site of fracture, and the severity of the injury may be overlooked during physical exam if the proximal fibula is not carefully palpated. Radiographic evaluation of the tibia and fibula are recommended if there is any focal tenderness of the proximal fibula.

In summary, the 3-view ankle radiographic examination is good at identifying fractures that will need immobilization and/or surgical intervention for treatment. A negative radiographic or MRI examination is not sufficient to exclude those patients who may eventually need immobilization and/or surgical intervention; therefore, clinical follow-up is essential in the patient who has suffered an acute ankle injury but has negative imaging studies.

Summary

- In a patient who meets the OAR for a suspected ankle fracture, a three-view (AP, lateral, and mortise) ankle radiographic study is indicated.
- If the radiograph is negative, clinical follow-up is warranted for ruling out an ankle injury that may eventually need treatment.

Abbreviations

- AP, anteroposterior
- CT, computed tomography
- MRI, magnetic resonance imaging
- US, ultrasonography

Relative Radiation Level Designations

Relative Radiation Level*	Adult Effective Dose Estimate Range	Pediatric Effective Dose Estimate Range
O	0 mSv	0 mSv
☢	<0.1 mSv	<0.03 mSv
☢☢	0.1-1 mSv	0.03-0.3 mSv
☢☢☢	1-10 mSv	0.3-3 mSv
☢☢☢☢	10-30 mSv	3-10 mSv
☢☢☢☢☢	30-100 mSv	10-30 mSv
*RRL assignments for some of the examinations cannot be made, because the actual patient doses in these procedures vary as a function of a number of factors (e.g., region of the body exposed to ionizing radiation, the imaging guidance that is used). The RRLs for these examinations are designated as "Varies."		

Clinical Algorithm(s)

Algorithms were not developed from criteria guidelines.

Scope

Disease/Condition(s)

Acute trauma to the ankle

Guideline Category

Diagnosis

Evaluation

Clinical Specialty

Emergency Medicine

Family Practice

Orthopedic Surgery

Pediatrics

Radiology

Intended Users

Health Plans

Hospitals

Managed Care Organizations

Physicians

Utilization Management

Guideline Objective(s)

To evaluate the appropriateness of initial radiologic examinations for patients with acute trauma to the ankle

Target Population

Patients with acute trauma to the ankle

Interventions and Practices Considered

1. X-ray
    - Ankle
    - Ankle Broden's view
    - Tibia/fibula
2. Computed tomography (CT) ankle
    - Without contrast
    - With contrast
    - Without and with contrast
3. Magnetic resonance imaging (MRI) ankle
    - Without contrast
    - Without and with contrast
4. Ultrasound (US) ankle

Major Outcomes Considered

- Utility of radiologic examinations in differential diagnosis
- Sensitivity, specificity, accuracy, and positive predictive value of radiologic examinations

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Literature Search Procedure

Staff search in PubMed only for peer reviewed medical literature for routine searches. Any article or guideline may be used by the author in the narrative but those materials may have been identified outside of the routine literature search process.

The Medline literature search is based on keywords provided by the topic author. The two general classes of keywords are those related to the condition (e.g., ankle pain, fever) and those that describe the diagnostic or therapeutic intervention of interest (e.g., mammography, MRI).

The search terms and parameters are manipulated to produce the most relevant, current evidence to address the American College of Radiology Appropriateness Criteria (ACR AC) topic being reviewed or developed. Combining the clinical conditions and diagnostic modalities or therapeutic procedures narrows the search to be relevant to the topic. Exploding the term "diagnostic imaging" captures relevant results for diagnostic topics.

The following criteria/limits are used in the searches.

1. Articles that have abstracts available and are concerned with humans.
2. Restrict the search to the year prior to the last topic update or in some cases the author of the topic may specify which year range to use in the search. For new topics, the year range is restricted to the last 10 years unless the topic author provides other instructions.
3. May restrict the search to Adults only or Pediatrics only.
4. Articles consisting of only summaries or case reports are often excluded from final results.

The search strategy may be revised to improve the output as needed.

Number of Source Documents

The total number of source documents identified as the result of the literature search is not known.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Study Quality Category Definitions

Category 1 - The study is well-designed and accounts for common biases.

Category 2 - The study is moderately well-designed and accounts for most common biases.

Category 3 - There are important study design limitations.

Category 4 - The study is not useful as primary evidence. The article may not be a clinical study or the study design is invalid, or conclusions are based on expert consensus. For example:

a. The study does not meet the criteria for or is not a hypothesis-based clinical study (e.g., a book chapter or case report or case series description).
b. The study may synthesize and draw conclusions about several studies such as a literature review article or book chapter but is not primary evidence.
c. The study is an expert opinion or consensus document.

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The topic author drafts or revises the narrative text summarizing the evidence found in the literature. American College of Radiology (ACR) staff draft an evidence table based on the analysis of the selected literature. These tables rate the strength of the evidence (study quality) for each article included in the narrative text.

The expert panel reviews the narrative text, evidence table, and the supporting literature for each of the topic-variant combinations and assigns an appropriateness rating for each procedure listed in the table. Each individual panel member assigns a rating based on his/her interpretation of the available evidence.

More information about the evidence table development process can be found in the ACR Appropriateness Criteria® Evidence Table Development document (see the "Availability of Companion Documents" field).

Methods Used to Formulate the Recommendations

Expert Consensus (Delphi)

Description of Methods Used to Formulate the Recommendations

Rating Appropriateness

The appropriateness ratings for each of the procedures included in the Appropriateness Criteria topics are determined using a modified Delphi methodology. A series of surveys are conducted to elicit each panelist's expert interpretation of the evidence, based on the available data, regarding the appropriateness of an imaging or therapeutic procedure for a specific clinical scenario. American College of Radiology (ACR) staff distribute surveys to the panelists along with the evidence table and narrative. Each panelist interprets the available evidence and rates each procedure. The surveys are completed by panelists without consulting other panelists. The appropriateness rating scale is an ordinal scale that uses integers from 1 to 9 grouped into three categories: 1, 2, or 3 are in the category "usually not appropriate"; 4, 5, or 6 are in the category "may be appropriate"; and 7, 8, or 9 are in the category "usually appropriate." Each panel member assigns one rating for each procedure for a clinical scenario. The ratings assigned by each panel member are presented in a table displaying the frequency distribution of the ratings without identifying which members provided any particular rating.

If consensus is reached, the median rating is assigned as the panel's final recommendation/rating. Consensus is defined as eighty percent (80%) agreement within a rating category. A maximum of three rounds may be conducted to reach consensus. Consensus among the panel members must be achieved to determine the final rating for each procedure.

If consensus is not reached, the panel is convened by conference call. The strengths and weaknesses of each imaging procedure that has not reached consensus are discussed and a final rating is proposed. If the panelists on the call agree, the rating is proposed as the panel's consensus. The document is circulated to all the panelists to make the final determination. If consensus cannot be reached on the call or when the document is circulated, "No consensus" appears in the rating column and the reasons for this decision are added to the comment sections.

This modified Delphi method enables each panelist to express individual interpretations of the evidence and his or her expert opinion without excessive influence from fellow panelists in a simple, standardized and economical process. A more detailed explanation of the complete process can be found in additional methodology documents found on the ACR Web site (see also the "Availability of Companion Documents" field).

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

The guideline developers reviewed published cost analyses.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The recommendations are based on analysis of the current literature and expert panel consensus.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Selection of appropriate radiologic imaging procedures for evaluating patients with suspected acute trauma to the ankle

Potential Harms

Relative Radiation Level

Potential adverse health effects associated with radiation exposure are an important factor to consider when selecting the appropriate imaging procedure. Because there is a wide range of radiation exposures associated with different diagnostic procedures, a relative radiation level (RRL) indication has been included for each imaging examination. The RRLs are based on effective dose, which is a radiation dose quantity that is used to estimate population total radiation risk associated with an imaging procedure. Patients in the pediatric age group are at inherently higher risk from exposure, both because of organ sensitivity and longer life expectancy (relevant to the long latency that appears to accompany radiation exposure). For these reasons, the RRL dose estimate ranges for pediatric examinations are lower as compared to those specified for adults. Additional information regarding radiation dose assessment for imaging examinations can be found in the American College of Radiology (ACR) Appropriateness Criteria® Radiation Dose Assessment Introduction document (see "Availability of Companion Documents" field).

Qualifying Statements

Qualifying Statements

The American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA)

have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

Mosher TJ, Kransdorf MJ, Adler R, Appel M, Beaman FD, Bernard SA, Bruno MA, Dempsey ME, Fries IB, Khoury V, Khurana B, Roberts CC, Tuite MJ, Ward RJ, Zoga AC, Weissman BN, Expert Panel on Musculoskeletal Imaging. ACR Appropriateness CriteriaÂ® acute trauma to the ankle [online publication]. Reston (VA): American College of Radiology (ACR); 2014. 10 p. [66 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

1995 (revised 2014)

Guideline Developer(s)

American College of Radiology - Medical Specialty Society

Source(s) of Funding

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

Guideline Committee

Committee on Appropriateness Criteria, Expert Panel on Musculoskeletal Imaging

Composition of Group That Authored the Guideline

Panel Members: Timothy J. Mosher, MD (*Principal Author*); Mark J. Kransdorf, MD (*Panel Vice-chair*); Ronald Adler, MD, PhD; Marc Appel, MD; Francesca D. Beaman, MD; Stephanie A. Bernard, MD; Michael A. Bruno, MD; Molly E. Dempsey, MD; Ian Blair Fries, MD; Viviane Khoury, MD; Bharti Khurana, MD; Catherine C. Roberts, MD; Michael J. Tuite, MD; Robert J. Ward, MD; Adam C. Zoga, MD; Barbara N. Weissman, MD (*Panel Chair*)

Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Bennett DL, Daffner RH, Weissman BN, Bancroft L, Blebea JS, Fries IB, Jacobson JA, Morrison WB, Payne WK III, Resnik CS, Roberts CC, Schweitzer ME, Seeger LL, Taljanovic MS, Wise JN, Expert Panel on Musculoskeletal Imaging. ACR Appropriateness Criteria® suspected ankle fractures. [online publication]. Reston (VA): American College of Radiology (ACR); 2008. 4 p. [26 references]

Guideline Availability

Electronic copies: Available from the American College of Radiology (ACR) Web site.

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

Availability of Companion Documents

The following are available:

- ACR Appropriateness Criteria®. Overview. Reston (VA): American College of Radiology; 2013 Nov. 3 p. Electronic copies: Available from the American College of Radiology (ACR) Web site.
- ACR Appropriateness Criteria®. Literature search process. Reston (VA): American College of Radiology; 2013 Apr. 1 p. Electronic copies: Available from the ACR Web site.
- ACR Appropriateness Criteria®. Evidence table development – diagnostic studies. Reston (VA): American College of Radiology; 2013 Nov. 3 p. Electronic copies: Available from the ACR Web site.
- ACR Appropriateness Criteria®. Radiation dose assessment introduction. Reston (VA): American College of Radiology; 2013 Nov. 3 p. Electronic copies: Available from the ACR Web site.
- ACR Appropriateness Criteria®. Procedure information. Reston (VA): American College of Radiology; 2013 Apr. 1 p. Electronic copies: Available from the ACR Web site.
- ACR Appropriateness Criteria® acute trauma to the ankle. Evidence table. Reston (VA): American College of Radiology; 2014. 26 p. Electronic copies: Available from the ACR Web site.

Patient Resources

None available

NGC Status

This summary was completed by ECRI on May 6, 2001. The information was verified by the guideline developer as of June 29, 2001. This summary was updated by ECRI Institute on March 6, 2006, May 21, 2010, and July 16, 2014.

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